



**Department of Administrative Services  
Information Technology Enterprise (ITE)**

**Response to the Legislative  
Oversight Committee Questions Related to  
Electronic Document Storage and Retention**

**DRAFT**

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## What are the costs of storing and maintaining records?

ITE's answer to this question will compare the storage capacity and comparative storage cost of filing cabinets storing paper and electronic data storage.

### Physical Filing Cabinets

Vertical file cabinets are less efficient than lateral filing units. Therefore, this comparative analysis will provide estimates for both types of storage. Both types of filing cabinets are in use throughout state government.


A typical vertical 5-drawer filing cabinet holds 7.5 cubic feet of records and occupies 7.5 square feet of floor space including room to stand while pulling out a drawer. Therefore, **1 square foot of floor space is needed to store 1 cubic foot of records.**

A typical 5-drawer 42" wide lateral filing unit provides 195 linear inches of file capacity or 13.0 cubic feet. It also occupies 7.5 square feet of floor space. **Therefore, 1 square foot of floor space is needed to store 1.73 cubic feet of records.** Lateral filing in this example is 73% more space efficient.

The Capitol Complex Association Fee is \$3.51/square foot for office space and \$2.72/square foot for storage space in the State Capitol Complex. This does not include utility cost and depreciation. To this is added \$.18/square foot for routine maintenance, resulting in a cost of \$3.69/square foot and \$2.90/square foot for office and storage space, respectively.

Since an inexpensive vertical file cabinet costs \$250, the equipment cost for a cubic foot of records, when amortized over 10 years, is \$3.33 per year. An inexpensive lateral file cabinet costs \$650. Therefore, the equipment cost for a cubic foot of records, when amortized over 10 years is \$5.00 per year.

### Annual Cost for Storing Paper Records (Per Cubic Foot) in Capitol Complex Office Space



	Vertical File Cabinet		Lateral File	
	Capitol Complex Office Space	Capitol Complex Storage Space	Capitol Complex Office Space	Capitol Complex Storage Space
Space Cost	\$3.69	\$2.90	\$2.13	\$1.68
Filing Equipment	\$3.33	\$3.33	\$5.00	\$5.00
Storage Cost Per Cubic Foot of Paper	\$7.02	\$6.23	\$7.13	\$6.68



### Equating Paper Storage to Electronic Storage

For purposes of comparing physical paper storage and electronic records:

- 1 cubic foot of paper = 2,500 pages
- 1 page of paper contains data equivalent 500 bytes per page to 5,000 bytes per page (compressed/uncompressed). For the purposes of this comparison, we will assume an average data equivalent of 2K (i.e. 2,048 characters) per page.

Consequently, 1 cubic foot of paper = 2,500 pages = 5 megabytes of data storage

### DAS-ITE Annual Cost of Storing 5 Megabytes of Data Electronically

Storage Area Network Disk ..... **\$0.43** (All accessible in about 50/1,000<sup>th</sup> of a second)

Network Attached Tape Storage ..... **\$0.21**

### Total DAS-ITE Storage Area Network (SAN) Storage Capacity And Its Paper Equivalent

DAS-ITE Storage Area Network Disk and Tape Capacity (October, 2005) and the Equivalent Volume of Paper	Number of Times You Could Fill These Buildings With the Equivalent Amount of Paper		
	State Capitol Building (6,634,914 cu. ft.)	Wells Fargo Arena (4,111,625 cu. ft.)	Polk County Convention Complex (954,100 cu. ft.)
SAN Attached Disk Capacity is 37 Terabytes, which is equivalent to 7,759,462 Cubic Feet or 88,176 Metric Tons (2,204 pounds to the metric ton) of Paper.	1.2 Times	1.9 Times	8.1 Times
SAN Attached Tape Capacity is 227 Terabytes, which is equivalent to 47,605,350 Cubic Feet or 540,970 Metric Tons (2,204 pounds to the metric ton) of Paper.	7.2 Times	11.6 Times	49.9 Times

The SAN attached disk and tape storage is equivalent to 4,465,709 5-drawer file cabinets.

## **For outside requests, what are the costs of providing records from storage including number of staff, time spent fulfilling requests?**

“Outside” requests for records generally fall into two categories – specific requests for records generated and maintained as part of a specific state program; and requests made under the Iowa Open Records Law (Iowa Code Chapter 22).

### **Example 1: Requests for records generated and maintained as part of a specific state program**

The State of Iowa issues licenses and permits and is the official repository for certain vital and historical records such as birth and death certificates and criminal histories. The State of Iowa routinely processes requests for duplicates, certified copies, or searches of records on file. The costs associated with maintaining these types of records typically are dependent upon the origin, format, and recordkeeping requirements. The Department of Administrative Services - Information Technology Enterprise provides information services for various state agencies, boards, and commissions, however, does not possess or maintain any such recordkeeping systems for its own use.

### **Example 2: Requests made under the Iowa Open Records Law (Iowa Code Chapter 22)**

Open Records requests are highly variable in nature and the resources (and associated costs) are difficult to characterize. Generally speaking, the more specific records requests can be addressed less expensively and with greater speed. We occasionally receive Open Records requests similar to “any and all government records pertaining to John Doe”. The cost of conducting a search in response to such a request can cost thousands of dollars. In such instances, the requestor is presented with an estimate of conducting such a search and asked to pay for the cost of the search in advance or is given the option of narrowing the request.

Historically, the Information Technology Enterprise has had very few requests for records in its’ custody [Iowa Code §305.2(4) defines “custody” as guardianship or control of records, including both physical possession, referred to as physical custody, and legal responsibility, referred to as legal custody.]

## **Have any diseases been found in stored documents?**

ITE has had no experience with diseases found in stored documents.

## **Have you surveyed other states regarding methods used for storage of records, length of time records are stored, legal requirements regarding retention of records?**

ITE conducted a survey of the e-mail retention periods and practices of other states and the Federal government in 2004. A copy of that survey accompanies this document.

In government and in business, records are retained for their value. In appraising the value of government records, one or more of the following may apply:

**Administrative Value** - the value of records based on their usefulness for carrying out the agency’s business requirements. Administrative value typically derives from the information contained in the record.

**Fiscal Value** – the usefulness of records in documenting an agency’s financial transactions and obligations.

**Legal Value** – the usefulness of records in documenting legally enforceable rights or obligations, both those of a government agency or other organization and those of persons directly affected by the agency's activities.

**Historical Value** – the value records have to warrant their permanent retention beyond the time they are needed for their normal administrative, fiscal, or legal purposes. Historical value is usually based on the evidential and/or informational value of the records.

The value assigned to different types of records may require specific records management practices which must be taken into account when developing records management systems.

## **Suggestions to the Government Oversight Committee regarding suggested changes in the law on record retention, including length of time, methods for storage, public access to archived records?**

### **Electronic Records Management – Background**

The following statement applies to the Federal Government and every State and Local government in the United States:

*“Technology and the ‘electronic revolution’ has a substantial impact on the way governments conduct business and present challenges for capturing, preserving, managing, storing and making accessible electronic records.*

*Significant amounts of critical electronic data have already been lost. As government records are increasingly generated and stored in computer-based information systems, the state faces the challenge of managing and preserving these digital documents. Many are critical to the survival of the State’s history and culture, captured in the day-to-day business of government.”*

Source: Washington State Archives, Introduction to e-Records Management

In addition to the electronic information that is no longer available, most of the electronic files in state government in Iowa are currently organized and managed outside of the established records management policies and procedures established in Iowa Code Chapter 305 and the corresponding Iowa Administrative Code Chapter 671. During the electronic revolution in the last thirty years, the basic records management practices in state government have remained essentially unchanged.

During that time, automated State programs with specific records management requirements (e.g. Iowa Medicaid Management Information System, Integrated Information for Iowa – I/3, State Income and Sales Tax systems) have had individually architected and managed records management solutions. The specifics of these records management solutions (i.e. number and type of backups, data retention periods, etc.) are based on the statutory and business requirements for each program, taking into account the short, medium, and long-term preservation criteria for each type of record. While mirroring the specifications of the retention and destruction requirements contained agency record series retention and disposition schedules for paper and other types of records, the electronic record retention and management specifications typically are not defined in the record series retention and disposition schedules.

Addressing these issues is the shared responsibility of the Records Management Professionals, Information Technology Professionals, and Agency Business Professionals.



Cornell University has developed a matrix that details the “Five Organizational Stages of Digital Preservation”. (See Table 1)

Table 1. Cornell’s Five Organizational Stages of Digital Preservation

Stage	Value	Key Indicators		
		Policy / Planning	Technology	Resources
<b>Acknowledge:</b> Digital preservation a local concern	1	Non-existent, implicit, very high level	Non-existent, heterogeneous, decentralized	Generally low, finite, ad hoc financial commitment
<b>Act:</b> Initiate Digital preservation projects	2	Implicit or general, increased evidence of commitment	Project-specific, reactive, ad hoc	Often project based funding
<b>Consolidate:</b> Segue from projects to programs	3	Basic and essential policies	Assess technology investment, more pro-active	Some funding and support beyond projects, but limited
<b>Institutionalize:</b> Incorporate the larger environment	4	Consistent, systematic, comprehensive policy framework for planning	Anticipate needs, investments defined by management, implemented across the system	Sustainable funding identified for core program areas and enhancement
<b>Externalize:</b> Embrace collaboration and dependencies	5	Virtual organizations complement institutional ones; collaboration inherent in resource planning	Distributed and highly integrated Extra-organizational features/services	Varying levels of investment, but sustainable funding; possibly distributed financial management

The Executive Branch of state government in Iowa finds itself in the “Act” stage as outlined above. Automated State programs with specific records management requirements (i.e. Iowa Medicaid Management Information System, Integrated Information for Iowa – I/3, State Income and Sales Tax systems, for example) have had individually architected and managed records management solutions for over thirty years. The specifics of these records management solutions (i.e. number and type of backups, data retention periods, etc.) are based on the statutory and business requirements for each program, taking into account the short, medium, and long-term preservation criteria listed above. While mirroring the specifications of the retention and destruction requirements contained agency record series retention and disposition schedules for paper and other types of records, the electronic record retention and management specifications typically are not defined in record series retention and disposition schedules.

**Legislative Recommendation:** Move to the “Consolidate” stage as outlined in Table 1 by developing compliant electronic records management systems. This would entail developing electronic records management policies and lead to the creation of a digital state archive. In preparation for this implementation, the overall records management practices of state government should be reviewed and recommendations be made for updating our policies and practices.

The following requirements must be met by any compliant electronic record management system:

- Electronic records “made, produced, executed, or received pursuant to law in connection with the transaction of official business of state government” are classified by Iowa law as a “record”<sup>1</sup> and are subject to the retention and destruction requirements as defined in the agency record series retention and disposition schedules.
- In any recordkeeping system, records must be brought under intellectual control to enable them to be managed, retrieved, and understood. This involves documenting information about the record (i.e. its origins, use, and any unique record identification (i.e. subject, originator, recipients, date of origin, etc.)
- Electronic records must retain their content, structure, and the business context in which they created. Structure refers to both the layout of the message and the links to attachments and related messages in that particular interchange of messages. Context refers to the information documenting the source and destination of the message and other related information usually found in the message header.
- Electronic records are not required to be maintained in their original hardware and software environments as long as the original content, structure and context of the records is maintained.
- If electronic records are retained in electronic form and have continuing value, they must be migrated across changes in hardware and software platforms in order to maintain accessibility.
- In order to maintain their value, stored electronic records must be inviolate (i.e. they need to be maintained in a system which prevents the original records from being altered or manipulated).

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<sup>1</sup> Iowa Code §305.2(9) defines a record as: “Record means a document, book, paper, electronic record, photograph, sound recording, or other material, regardless of physical form or characteristics, made, produced, executed, or received pursuant to law in connection with the transaction of official business of state government. Record does not include library and museum material made or acquired and preserved solely for reference or exhibition purposes or stocks of publications and unprocessed forms.”





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**Executive Branch Recommendation:** Electronic records archives must take the following aspects of digital records management into account:

- **Long-term preservation** – Continued access to digital materials, or at least to the information contained in them, indefinitely.
- **Medium-term preservation** – Continued access to digital materials beyond changes in technology for a defined period, but not indefinitely.
- **Short-term preservation** – Access to digital materials for a defined period of time while use of the digital records is anticipated, but which does not extend beyond the foreseeable future.

Electronic systems and the records they generate each have their own life cycles, and those life cycles are seldom in sync. Software developers, when creating a system, must ensure the records generated by the system adequately serve the current business requirements and they must also ensure the records survive the eventual decommissioning of a system by taking the short, medium, and long-term requirements into account.

In the near term to address these issues and bring electronic records management into sync with the general records management requirements, it is recommended that an electronic counterpart to the “Records Series Inventory and Retention and Disposition Schedule Form” as specified in IAC 671-3.2(305)<sup>2</sup> be developed and made available to agencies through a web application. This electronic form would be completed when the records backup and retention requirements are developed as electronic systems are designed or updated.

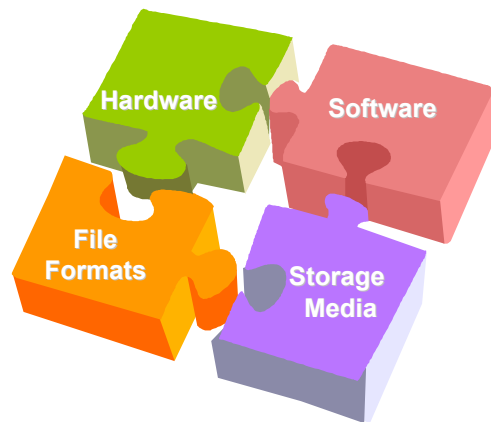
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<sup>2</sup> **671–3.2(305) Form to use.** A Records Series Inventory and Retention and Disposition Schedule Form is used for the inventorying of agency records and for the development or revision of records series retention and disposition schedules. The form is available from the state archives and records bureau of the Department Of Cultural Affairs

## Appendix 1. The Long Term Viability of Electronic Records

The preservation challenges facing governmental entities that create and maintain electronic records have remained constant for the past thirty years. Such challenges include:

- **Electronic records are inherently unstable.** Technological obsolescence launches a constant four-pronged attack against the possibility of preservation: hardware, software, file formats, and storage media formats are all subject to change and technology advances so quickly and so often that change is a constant. Organizations need to keep their hardware and software current – upgrading to new versions regularly - and they must ensure that electronic records remain usable in each new environment.



- **Maintaining electronic records over time is not a high priority for government entities.** State agencies have successfully maintained usable electronic data over time for information vital to their operations. When government entities have no compelling reason to expend resources to preserve electronic records beyond the useful life for business and operational purposes, it is likely that they will no longer be maintained.
- **Cost effective techniques for preserving electronic records in useable formats are not yet available.** The archival community as a whole has not developed a standard solution for the preservation of electronic records. The State Archivist lacks the resources to preserve electronic records.
- **Permanent electronic media currently does not exist.** Many organizations incorrectly believe that a CD-ROM or a computer tape will always last until the end of the data's greatest possible life expectancy – which is not at all true. Disc technologies are often very susceptible to environmental conditions (light, humidity, air-borne particulates, and even human fingerprints) and may have a much shorter expected life span under these less than optimal conditions.

The use of electronically signed electronic records will raise special concerns. The importance of preserving the context and links between components of electronic records is critical if they are electronically signed. Such contextual information provides additional evidence to support the reliability and authenticity of the signed electronic record and/or may actually constitute the electronic signature itself. Therefore, the key challenges that must be faced by governmental entities in maintaining electronically signed electronic records are to:

- Determine what information needs to be retained to maintain a valid, authentic, and reliable signed electronic record.
- Preserve the link or association between the various components of a signed record over time.

### **Possible Solutions to the Long Term Viability of Electronic Records**

There is still no single electronic records preservation solution that serves as a standard. Migration from older to newer computing platforms and media — with all its inherent faults (heavy costs and possible data degradation)—remains the most common solution used by archivists across the country. New solutions being proposed include the use of Extensible Markup Language (XML) and the Portable Document Format (PDF) as answers for some preservation issues.

XML is currently the focus of much electronic records research and prototyping. XML, a sister language to HTML which is widely used on the Internet, allows the conversion of textual records into a pure text (ASCII or Unicode) format that will be relatively simple to preserve over time. Since XML allows for the tagging of data within a file, it allows a way to reproduce the general look and feel of an electronic document without the impossible burden of retaining the document in its native and unstable word processing format. Additionally, XML is serving as one element of the general electronic records plan of the federal government's National Archives and Records Administration (NARA). This plan, titled the *Electronic Records Archives*<sup>3</sup>, includes millions of dollars of research each year, and has as its goal the development of a scalable model for preserving and providing access to archival electronic records.

A preservation methodology working from a different set of assumptions is the Portable Document Format Archives (or PDF/A) development program<sup>4</sup>. Supported by the Adobe Corporation, the PDF/A project's goal is to develop a version of PDF that would guarantee long-term accessibility. It would exclude those elements now supported by PDF that are likely not to be supported long-term (such as Java scripting). By identifying a clear set of features of this format, Adobe itself (and potentially other vendors, since PDF code is based on open standards) would be able to ensure that any PDF reader had the ability to read the PDF/A format into the future... PDF does a significantly better job of reproducing the look and feel of documents in their original formats.

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<sup>3</sup> Additional information on Electronic Records Archives can be found on the NARA website at [http://www.archives.gov/electronic\\_records\\_archives/](http://www.archives.gov/electronic_records_archives/)

<sup>4</sup> For additional information on PDF/A see William G. LaFlurgy, "PDF/A: Developing a File Format for Long-Term Preservation," RLG DigiNews Digest (December 15, 2003, Volume 7, Number 6) or at [http://www.rlg.org/preserv/diginews/v7\\_n6\\_feature1.html](http://www.rlg.org/preserv/diginews/v7_n6_feature1.html)

## Appendix 2 - Distributed Custody - An Approach to Electronic Document Archiving

Past practice has been for state agencies with paper files meeting the definitions in their records series retention and disposition schedule to physically store the records within the agency as long as the records are active or may need to be accessed on short notice. When the records are stored in such a manner, they are in the physical and legal custody of the agency. Inactive files that must be retained for legal or administrative reasons are sent to the State Records Center for storage until the date of their scheduled destruction. When the records are stored in such a manner, they are in the physical custody of the State Archivist but still in the legal custody of the agency. Records meeting the guidelines for permanent storage (i.e. official records that have significant administrative, legal, and/or fiscal value and have long-term historical value) are transferred to the state archives and are in the legal and physical custody of the state archivist. Each agency makes the determinations of record classifications and retention periods in consultation with the State Records Commission, based upon their individual business, operational, and legal requirements.

The establishment of an electronic archive for digital data will require a review and analysis of past records management practices. One proposal for adapting to evolving requirements is to implement a fundamental change to custodial arrangements for State archives in electronic form: *distributed custody*. This requires the organization creating the electronic records to maintain them in their computing environment, and migrate them to new hardware and software platforms as that environment changes. This strategy addresses technological change by exploiting the creating organization's need to transfer current data to new platforms: electronic records of longer-term value are also transferred at the same time.

The relevant archives institution (i.e. the Office of the State Archivist and the State Records Commission) to ensure that a means is established for external users to have access to the records by, for example, logging onto the creators' systems with appropriate access rights and restrictions. The archives institution maintains finding aids and some of the metadata.

This *distributed custody* model does not involve the State Archivist abandoning responsibility for electronic records of continuing value. It is more appropriately described as an 'approved depository arrangement', whereby agencies and/or internal service providers keep physical custody of the records. The State Archivist exercises designated responsibilities towards the records by setting standards and monitoring their implementation. The State Archivist and State Records Commission would function as the hub in a network of systems for maintaining and providing access to electronic records. There is apparently little practical experience with such a model at this time.

This strategy requires the active cooperation of the agencies with the backing of appropriate legislation. Agencies have a stake in the ongoing need to maintain electronic records as evidence for their business and accountability requirements. It becomes problematic when the cost justification for such a system is based on an ill-defined research value. It may also be necessary to provide funding to help agencies maintain the distributed electronic State archive beyond the period required to meet the specific agency business and accountability needs.

The increasingly complex nature of the electronic records that agencies are creating means that the responsibility for maintaining records of continuing value must become a responsibility shared between agencies and the State Archivist, each playing the part for which they are best equipped to achieve the desired outcome.

One of the benefits of distributed custody is that it partially addresses the elusive search for the "ideal" archival storage media for electronic records. Custodians of electronic archives will maintain the records using the storage media that form part of their computing environment at a given time and will migrate them to new media as part of periodic upgrades.

## Appendix 3. State Government Electronic Records Management Resources

1. Alabama
  - Guidelines for the Use of Digital Imaging Technologies for Long-Term Government Records - [http://www.archives.state.al.us/ol\\_pubs/digital.html](http://www.archives.state.al.us/ol_pubs/digital.html) (April 1997)
2. Alaska
  - The Administrative Code contains Guidelines for the Retention and Preservation of Electronic **Records**. <http://old-www.legis.state.ak.us/cgi-bin/folioisa.dll/aac?>
3. Arizona
  - Arizona 'LElectronic Records Taskforce <http://rpm.lib.az.us/alert/>
  - Digital Projects Guidelines <http://www.dlapr.lib.az.us/digital/index.html>
4. Arkansas
  - Electronic Records Study Commission  
[http://www.cio.state.ar.us/Legislation/FOIA/FOIA\\_Home.htm](http://www.cio.state.ar.us/Legislation/FOIA/FOIA_Home.htm)
  - Practical Approaches to Electronic Records Management and Preservation.  
[http://www.techarch.state.ar.us/domains/information/best\\_practices/RecordMgtGuideline.pdf](http://www.techarch.state.ar.us/domains/information/best_practices/RecordMgtGuideline.pdf) December 2002
5. California
  - Electronic Records Management Handbook <http://www.pd.dgs.ca.gov/recs/erm.htm> February 2002
6. Colorado
  - Recommended Storage and Handling Guidelines for the Maintenance of Electronic Records of Long-Term or Enduring Value  
[http://www.archives.state.co.us/elec\\_rec\\_storage.html](http://www.archives.state.co.us/elec_rec_storage.html)
7. Delaware
  - Guidelines for Maintaining and Preserving Records of Web-Based Activities.  
[http://www.state.de.us/sos/dpa/govsvcs/records\\_policies/guidelines\\_for\\_maintaining\\_and\\_preserving.shtml](http://www.state.de.us/sos/dpa/govsvcs/records_policies/guidelines_for_maintaining_and_preserving.shtml) February 2002
  - Model Guidelines for Electronic Records.  
[http://www.state.de.us/sos/dpa/govsvcs/records\\_policies/model\\_guidelines.shtml](http://www.state.de.us/sos/dpa/govsvcs/records_policies/model_guidelines.shtml) December 2003
8. Florida
  - Electronic Recordkeeping Rules  
[http://dlis.dos.state.fl.us/barm/rules/1B26\\_003FAC.pdf](http://dlis.dos.state.fl.us/barm/rules/1B26_003FAC.pdf)
9. Georgia
  - Adopting Electronic Records: Considerations for Government Officials.  
<http://www.sos.state.ga.us/archives/rms/aer.pdf> April 2003
  - Electronic Document Imaging Systems Guidelines  
<http://www.sos.state.ga.us/archives/rms/manuals/edisg.htm>

- Electronic Records Management: Checklist of Requirements  
<http://www.sos.state.ga.us/archives/rms/rims7.pdf> April 2002
- 10. Hawaii
  - Policy and Guidelines Relating to Electronic Records Retention and Disposition.  
<http://www.state.hi.us/dags/archives/c200102.pdf> August 2001
- 11. Idaho
  - A Statement of Principles for the Preservation of and Long-Term Access to Digital Objects in Idaho [http://www.idahohistory.net/electronic\\_records.html](http://www.idahohistory.net/electronic_records.html)
- 12. Indiana
  - Electronic Records [http://www.in.gov/icpr/records\\_management/rch\\_sec7.html](http://www.in.gov/icpr/records_management/rch_sec7.html)  
(section 7 of *Record Coordinator's Handbook*)
  - Records Management : The Legal Framework of Records and Information Management in State Government [http://www.in.gov/icpr/records\\_management/pubs/legal.html](http://www.in.gov/icpr/records_management/pubs/legal.html)
- 13. Kansas
  - Electronic Recordkeeping Resources  
<http://www.kshs.org/government/records/electronic/ermlinks.htm>
  - Electronic Records Management Guidelines.  
<http://www.kshs.org/government/records/electronic/electronicrecordsguidelines.htm> March 2001
- 14. Kentucky
  - Electronic Records Management Guidelines - File Formats.  
<http://www.kdla.ky.gov/recmanagement/tutorial/fileformats.htm> January 2004
  - General Schedule for Electronic and Related Records.  
<http://www.kdla.ky.gov/recmanagement/schedules/erecordsgeneral.pdf> June 2002
  - Understanding Records Management: Electronic Records  
<http://www.kdla.ky.gov/recmanagement/tutorial/electronicrecords.htm>
- 15. Maryland
  - Electronic Records Regulations  
<http://www.mdarchives.state.md.us/msa/intromsa/html/reg04.html> May 1998
- 16. Massachusetts
  - Application of the Public Records Law to Electronic Records Access.  
<http://www.state.ma.us/sec/arc/arcrmu/rmubul/bul396.htm> June 1996
  - Backing Up and Archiving Electronic Records.  
<http://www.state.ma.us/sec/arc/arcrmu/rmubul/bul196.htm> January 1996
  - Guideline for the Documentation of Electronic Record-Keeping Systems.  
<http://www.state.ma.us/sec/arc/arcrmu/rmu/ergde.htm> April 2002
- 17. Minnesota
  - Electronic Records Management Guidelines.  
<http://www.mnhs.org/preserve/records/electronicrecords/erguidelinestoc.html>  
February 2003
  - Legal Risk Analysis Tool <http://www.mnhs.org/preserve/records/tis/Legalrisk.html>

- Metadata <http://www.mnhs.org/preserve/records/metadata.html>
  - Minnesota Recordkeeping Metadata Standard.  
<http://www.mnhs.org/preserve/records/metadatastandard.html> May 2002
  - Trustworthy Information Systems Handbook.  
<http://www.mnhs.org/preserve/records/tis/tableofcontents.html> July 2002
18. Mississippi
- Electronic Records Applications <http://www.mdah.state.ms.us/arlib/elecrecs.html>
  - Electronic Records Draft Guidelines <http://www.mdah.state.ms.us/arlib/erglnav.html>
19. Missouri
- Electronic Records <http://www.sos.mo.gov/records/recmgmt/electronic.asp>
20. Nebraska
- Web Page Guidelines.  
<http://www.sos.state.ne.us/RecordsMgmt/GuidelineWebPagesMarch2003.pdf> March 2003
21. Nevada
- Electronic Document Management and Imaging Systems Guidelines  
<http://dmla.clan.lib.nv.us/docs/nsla/records/edm2.htm> May 2000
  - Electronic Records Requirements  
<http://dmla.clan.lib.nv.us/docs/nsla/nerc/statutory.htm>
  - Guidance for Electronic Recordkeeping  
<http://dmla.clan.lib.nv.us/docs/nsla/nerc/guidance.htm>
22. New Mexico
- 1.13.20 NMAC. Storage of Electronic Media at the State Records Center and Archives  
<http://www.nmcpr.state.nm.us/nmac/parts/title01/01.013.0020.htm>
  - 1.13.70 NMAC. Performance Guidelines for the Legal Acceptance of Public Records Produced by Information Technology Systems  
<http://www.nmcpr.state.nm.us/nmac/parts/title01/01.013.0070.pdf>
23. New York
- Electronic Document Management Systems—Standards.  
[http://www.oft.state.ny.us/policy/tp\\_9616a.htm](http://www.oft.state.ny.us/policy/tp_9616a.htm) January 1997
  - Guidelines for Electronic Records.  
<http://www.courts.state.ny.us/records/policies/Policy9.pdf> December 2001
  - Guidelines for Ensuring the Long Term Accessibility and Usability of Records Stored as Digital Images. <ftp://ftp.sara.nysed.gov/pub/nysaservices/grtip22.pdf> 1998
24. North Carolina
- Guidelines for Managing Public Records Produced by Information Technology Systems.  
<http://www.ah.dcr.state.nc.us/e-records/manrecrd/manrecrd.htm> April 2000
25. North Dakota
- Electronic Records Management Guidelines.  
<http://www.state.nd.us/itd/records/doc/erguide.pdf> September 1998

## 26. Ohio

- Databases as Public Records Guidelines  
<http://www.ohiojunction.net/erc/databases/databasesguidelines.html>
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